REMARKS/ARGUMENTS

Amendments to the Claims

Claim 1 has been amended to specify "generating an estimated carrier frequency offset according to a phase error between the estimated frequency response of the symbol signal **in a frequency domain** and an estimated frequency response of a following symbol signal **in the frequency domain**."

Claim 12 has been amended to include all the limitations of claim 15 and to specify "generating an estimated carrier frequency offset according to a phase error between the estimated frequency response of the symbol signal **in a frequency domain** and an estimated frequency response of a following symbol signal **in the frequency domain,**" and claim 20 has been amended to define "determining a phase error according to the estimated frequency response of the pilot signal of the symbol signal **in a frequency domain** and the estimated frequency response of the pilot signal of a following symbol signal **in the frequency domain**" and "**using a phase rotator** to perform carrier frequency offset compensation according to the accumulated phase rotation." Claim 15 has been cancelled correspondingly. As the "frequency" response must be estimated in a frequency domain, the applicant believes that the term "frequency domain" added to claims 1, 12, and 20 introduces no new matter.

Claim 6 has been amended to specify "the following symbol signal is compensated by the channel compensator **after** being compensated by the phase rotator", and claim 7 has been cancelled correspondingly. Claim 25 has been amended to specify "using a channel compensator to compensate the following symbol signal after compensating the following symbol signal according to the estimated residual phase error."

Claim 9 has been amended to specify "the data signal is compensated by a data subchannel compensator **after** being compensated by the phase rotator", and claim 10 has been cancelled correspondingly. Claim 27 has been amended to specify "using a data subchannel compensator to compensate the data signal after compensating the data signal according to the estimated residual phase error."

The support can be found in the applicant's disclosure (page 6; FIG. 5A and FIG.

7A). As shown in FIG. 5A and FIG. 7A, the applicant points out that the channel compensator 112 compensates a following symbol signal after the following symbol signal is compensated by the phase rotator 53, and the data subchannel compensator 75 compensates a data signal after the data signal is compensated by the phase rotator 74.

As no new matter is introduced due to the applicant's claim amendments, acceptance of the claim amendments is respectfully requested.

Claim Rejection – 101

Claim(s) 20-29 is/are rejected under 35 U.S.C. 101 as not falling within one of the four statutory categories of invention.

Response:

Claim 20 has been amended to specify utilizing a phase rotator to perform carrier frequency offset compensation according to the accumulated phase rotation. (*emphasis added*) Claims 25 and 27 have been amended to respectively define utilizing a channel compensator to compensate the following symbol signal after compensating the following symbol signal according to the estimated residual phase error and utilizing a data subchannel compensator to compensate the data signal after compensating the data signal according to the estimated residual phase error. (*emphasis added*) As hardware components (i.e., the claimed phase rotator, the claimed channel compensator, and the claimed data subchannel compensator) which fall within the other statutory class are involved in the steps recited in the method claim, the applicant therefore asserts that claims 20, 25, and 27 do not include purely mental steps and should be qualified as 35 U.S.C. 101 statutory processes. Similarly, the applicant asserts that the subject matters of claims 21-24, 26, and 28-29, which respectively depend upon claims 20, 25, and 27, also fall within a statutory category under 35 U.S.C. 101. Withdrawal of rejections under 35 U.S.C. 101 is respectfully requested.

Claim Rejections – 102(b) and 103(a)

Claims 6-7 are rejected under 35 U.S.C. 102(b) as being anticipated by Masato et al. (Japanese Publication Number: 2001-053712 (English machine translation)).

Claims 1, 3-5, 9-13, 15, 18 (apparatus) & 20-21, 23-29 (method) are rejected under 35 U.S.C. 103(a) as being unpatentable over Masato et al. (Japanese Publication Number: 2001-053712 (English machine translation)) in view of Hamaguchi (JP 409093302A (English Translation - Abstract)).

Claims 2, 14 (apparatus) & 22 (method) are rejected under 35 U.S.C. 103(a) as being unpatentable over Masato et al. (Japanese Publication Number: 2001-053712 (English machine translation)) in view of Hamaguchi (JP 409093302A (English Translation - Abstract)) and further in view of Frank et al. (7,324,599).

Response:

Claims 1 and 20

Regarding claim 1, even though one of ordinary skill in the art may modify the apparatus as described by Masato with the teachings of Hamaguchi, the applicant, however, asserts that neither Masato nor Hamaguchi teaches the claimed limitation "generating an estimated carrier frequency offset according to a phase error between the estimated frequency response of the symbol signal in a frequency domain and an estimated frequency response of a following symbol signal in the frequency domain." (*emphasis added*)

First of all, referring to Hamaguchi's abstract (English translated version), the applicant points out that Hamaguchi merely discloses generating a **frequency offset between a transmission carrier and a quasi synchronization detection reference signal**. Hamaguchi expressly discloses that such a frequency offset is between a transmission carrier and a **quasi synchronization detection reference** signal. The applicant respectfully points out that Hamaguchi fails to disclose, explicitly or implicitly, using a **receiver carrier** as the quasi synchronization detection reference signal; and further, the applicant contends that the quasi synchronization detection reference signal is by no means a receiver carrier according to teachings of Hamaguchi. Thus, the applicant asserts that a frequency offset between a transmission carrier and a **quasi synchronization detection reference signal**, as taught by Hamaguchi, is really not a frequency offset between a transmission carrier and a receiver carrier, i.e. the **carrier frequency offset**. Therefore, the applicant believes that the claimed carrier frequency

offset is not taught or suggested by Hamaguchi.

Secondly, the applicant points out that Hamaguchi merely teaches using **phase fluctuation formation of two consecutive pilot symbols**, but fails to particularly suggest using **phase fluctuation between frequency responses** of two pilot symbols in the **frequency domain**. Therefore, the applicant asserts that Hamaguchi fails to suggest generating a frequency offset according to a phase error between the **frequency responses** of two symbol signals in the **frequency domain**.

Since Examiner said that Masato does not disclose performing frequency offset between frequency responses of two symbol signals, the applicant asserts that the claimed feature "generating an estimated carrier frequency offset according to a phase error between the estimated frequency response of the symbol signal in a frequency domain and an estimated frequency response of a following symbol signal in the frequency domain" as recited in claim 1 is not taught/suggested by Hamaguchi in view of Masato. (*emphasis added*) Claim 1 should be placed in condition for allowance. In addition, claim 20 includes the limitations similar to that of claim 1, and should also be placed in condition for allowance. Withdrawal of the rejection and consideration of claims 1 and 20 is respectfully requested.

Claims 6 and 25

With reference to claim 6, referring to Masato's disclosure (Drawing 3 & Drawing 4), the applicant points out that the channel equalizing circuit (203) is utilized for processing a signal (s202) before a processed signal (s203) is processed by the phase compensator (206), and the channel equalizing circuit (303) is utilized for processing a signal (s302) before a processed signal (s303) is processed by the phase compensator (305). That is, Masato merely discloses that the signal (s202 or s302) is compensated by a channel circuit **before** being compensated by the phase rotator (206 or 305). Therefore, the applicant asserts that Masato fails to teach the claimed feature "the following symbol signal is compensated by the channel compensator after being compensated by the phase rotator." (*emphasis added*) The applicant asserts that the above-identified claimed limitation is not taught/suggested by Masato, and the rejections under 35 U.S.C. 102(b)

are overcome. Claim 6 should be found allowable over Masato.

In addition, the applicant would like to point out that after carefully reviewing the other cited reference, the Hamaguchi reference, the applicant finds no description pertinent to using a channel compensator to compensate the following symbol signal after the symbol signal is compensated by a phase rotator. Thus, the applicant asserts that Hamaguchi also fails to disclose the claimed feature "the following symbol signal is compensated by the channel compensator after being compensated by the phase rotator."

In view of above, as claim 25 has limitations similar to that of claim 6, the applicant asserts that claim 25 should also be found allowable over Hamaguchi in view of Masato. Withdrawal of the rejections under 35 U.S.C. 103(a) is respectfully requested.

Claims 9 and 27

In view of above arguments of claim 6, the applicant asserts that Masato fails to teach the claimed feature "the data signal is compensated by a data subchannel compensator after being compensated by the phase rotator." (*emphasis added*) In addition, referring to the teachings of Hamaguchi, the applicant finds no description pertinent to using a data subchannel compensator to compensate a data signal after the data signal is compensated by a phase rotator. Thus, the applicant asserts that neither Masato nor Hamaguchi discloses the claimed feature "the data signal is compensated by a data subchannel compensator after being compensated by the phase rotator." Claims 9 and 27 should be found allowable over the cited prior art.

Claim 12

In view of the above arguments of claim 1, the applicant asserts that neither Masato nor Hamaguchi teaches or suggests the claimed feature "generating the estimated carrier frequency offset according to the phase error between the estimated frequency response of the pilot signal of the symbol signal in a frequency domain and the estimated frequency response of the pilot signal of a following symbol signal in the frequency domain" as recited in claim 12. (*emphasis added*) Therefore, claim 12 should be placed in condition for allowance. Withdrawal of the rejection and consideration of

claim 12 is respectfully requested.

Claims 17-19

Referring to Masato's disclosure (Drawing 4; paragraph [0027] of English-translated version), the applicant points out that Masato merely discloses using the pilot subcarrier extracting circuit (3011), the phase rotation detector circuit (3012), the amount averaging circuit (3013), and the filter (3014) to process the subcarrier signals s3012, which are outputted by the phase compensator (305). In detail, the pilot subcarrier extracting circuit (3011) of Masato is only used for **extracting** a pilot subcarrier signal, and the phase rotation detector circuit (3012) of Masato is only used for **detecting** a phase rotation signal. The amount averaging circuit (3013) of Masato is only used for **detecting** an average phase rotation signal, and the filter (3014) of Masato is only used for **extracting** a phase rotation signal. That is, Masato fails to disclose using a **pilot subchannel compensator** for **compensating a pilot signal of the frequency offset-compensated symbol signal**, which is generated by a frequency offset compensator, to **generate a channel-compensated pilot signal**. Besides, Masato fails to disclose using a **channel compensator** to perform **channel compensation on the frequency offset compensated symbol signal**, which is generated by the frequency offset compensator.

In addition, referring to Hamaguchi's disclosure (English-translated Abstract), the applicant finds no description pertinent to using a **pilot subchannel compensator** for **compensating a pilot signal of the frequency offset-compensated symbol signal** to **generate a channel-compensated pilot signal** and using a **channel compensator** to perform a **channel compensation on the frequency offset compensated symbol signal**.

As the claimed pilot subchannel compensator recited in claims 17 and 19 and the claimed channel compensator recited in claim 18 are neither taught nor suggested by either of the cited Hamaguchi reference and the cited Masato reference, the applicant asserts that claims 17-19 should be found allowable. Additionally, claims 17-19 are dependent upon claim 12, and should be allowed if claim 12 is allowable.

Claim 28

Referring to Masato's Drawing 3 & Drawing 4, the applicant points out that Masato fails to disclose respectively using a **data subchannel compensator** for **compensate the data signal** and performing a **channel compensation on the symbol signal**. Masato merely suggests using a channel equalizing circuit (either 203 or 303) for performing channel equalization on symbol signals. That is to say, Masato only teaches utilizing a **single** channel compensator on the symbol signals. However, as claim 27 upon which claim 28 depends expressly defines "using a data subchannel compensator to compensate the data signal after compensating the data signal," the applicant asserts that the claimed limitation "performing a channel compensation on the symbol signal before performing compensation according to the estimated residual phase error on the data signal" is not suggested by Masato. (*emphasis added*) Specifically, in addition to a data subchannel compensation, a channel compensation is applied according to applicant's disclosure. Such a compensation scheme is not taught by Masato's teachings.

In addition, the applicant finds no description pertinent to using a data subchannel compensator to compensate the data signal and performing a channel compensation on the symbol signal after reviewing the English translated abstract of Hamaguchi.

In light of above, the applicant asserts that claim 28 should be found allowable over Masato in view of Hamaguchi. Additionally, claim 28 is dependent upon claim 27, and should be allowed if claim 27 is allowable.

Claims 2-5, 8, 13-14, 16, 21-24, 26, and 29

Claims 2-5 are dependent upon claim 1, and should be allowed if claim 1 is allowable.

Claim 8 is dependent upon claim 6, and should be allowed if claim 6 is allowable.

Claims 13, 14, 16 are dependent upon claim 12, and should be allowed if claim 12 is allowable.

Claims 21-24 are dependent upon claim 20, and should be allowed if claim 20 is allowable.

Claim 26 is dependent upon claim 25, and should be allowed if claim 25 is allowable.

Claim 29 is dependent upon claim 27, and should be allowed if claim 27 is allowable.

Claim 7, 10, 15

Claims 7, 10, 15 have been cancelled without prejudice.

Conclusion

Based on the above remarks/arguments, the applicant respectfully submits that all of the rejections set forth in the Office Action dated 12/08/2008 have been overcome and the pending claims are in condition for allowance. Withdrawal of the rejections and consideration of the pending claims are respectfully requested. If a telephone conference would facilitate the prosecution of this application, the Examiner is invited to contact the undersigned applicant's representative at the number indicated below.

Sincerely yours,

/Winston Hsu/ Date: 03/04/2009

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Note: Please leave a message in my voice mail if you need to talk to me. (The time in D.C. is 13 hours behind the Taiwan time, i.e. 9 AM in D.C. = 10 PM in Taiwan.)